

Westchester County Department of Health

2024.06

Community Health Data Report

2024.06

Vector Borne Diseases in Westchester County, 2023

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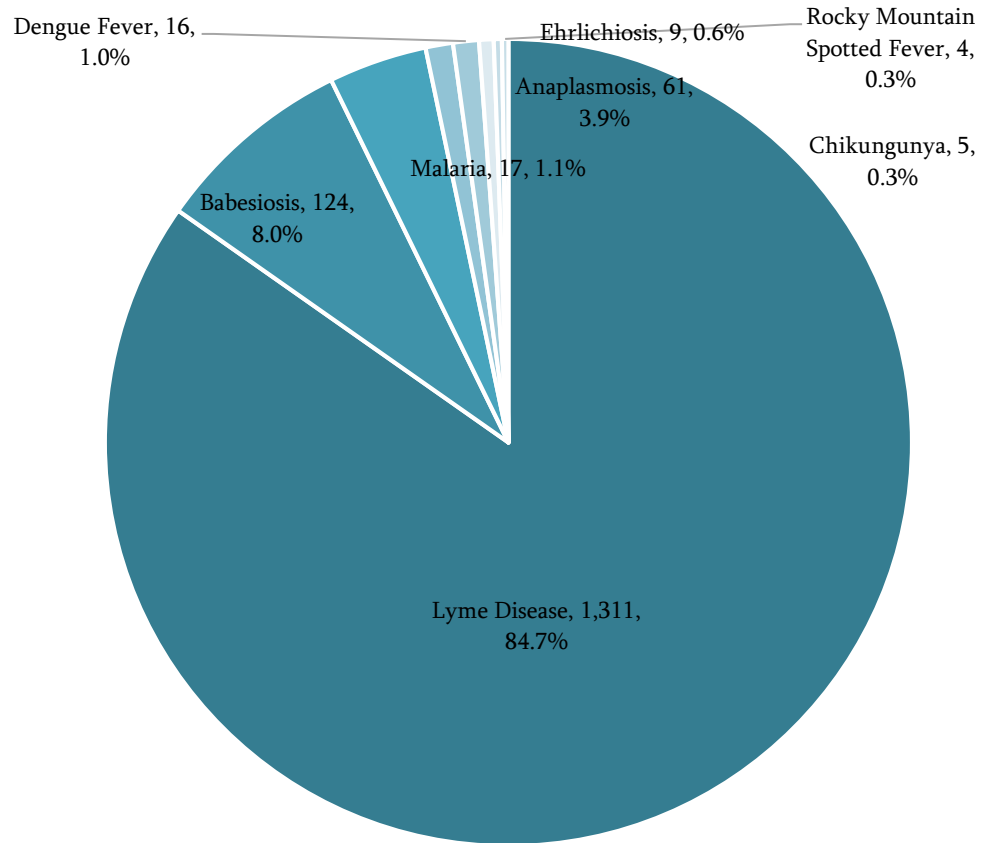
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Reported Vector Borne Diseases, Westchester County, 2023.



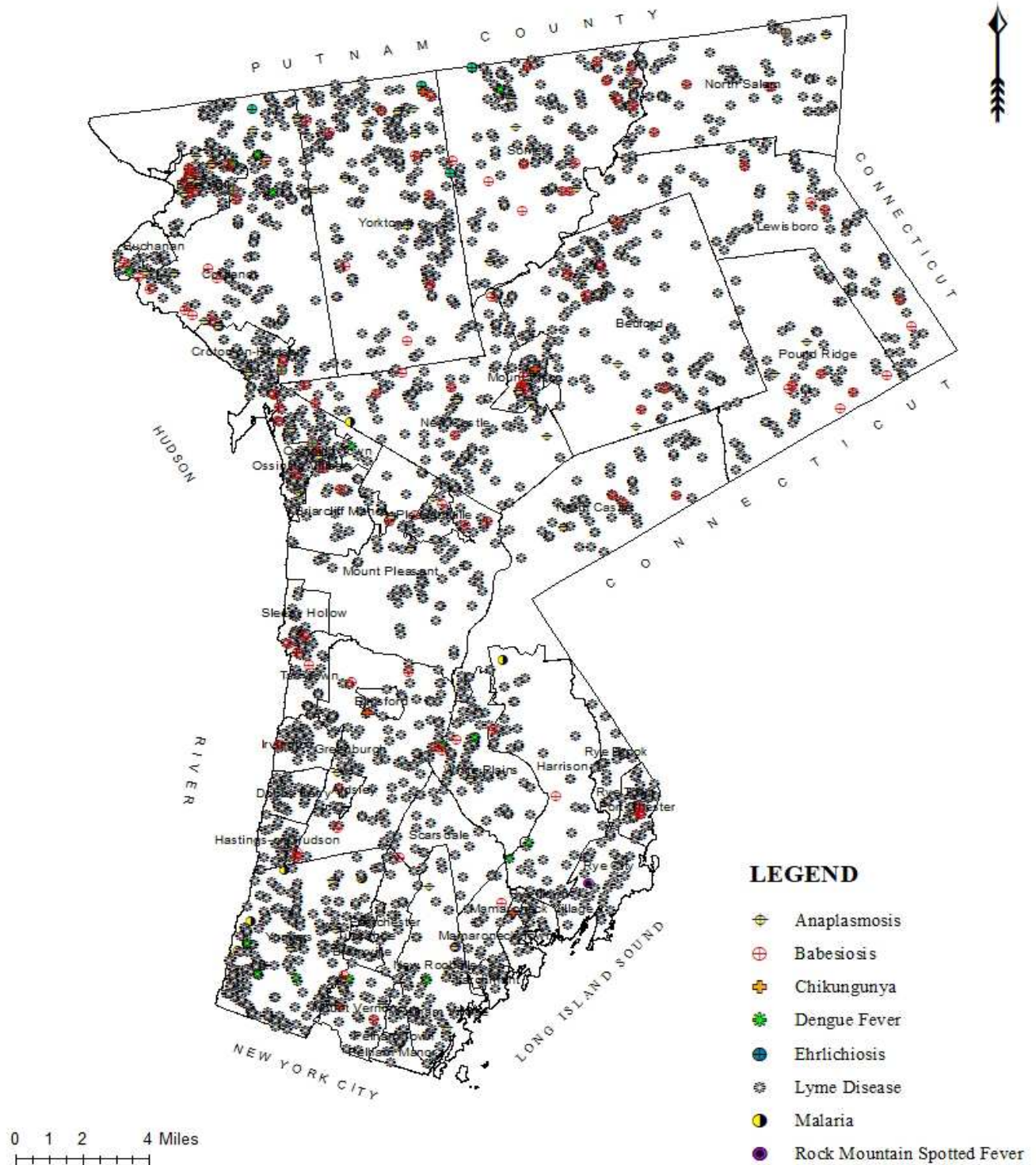
Source: New York State Department of Health. 2024.

Of the eight*¹ major reported vector borne diseases in Westchester County, five were the result of tick bites, representing 97.5% of all cases in 2023. Among them, Lyme Disease was the leading vector-borne diseases, representing 84.8% of all reported cases.

*¹. West Nile Virus, another vector borne disease, is reported in a separate data brief, therefore, not included in this document.

Overview

Geographical Distribution of All Major Reportable Vector Borne Diseases, Westchester County, 2023.



Source: New York State Department of Health. 2024.

OVERVIEW

Ticks are tiny parasites that feed on the blood of warm-blooded mammals, birds, reptiles, and amphibians. Most ticks go through four stages of life (egg, six-legged larva, eight-legged nymph, and adult) and must feed on blood at each stage after hatching from eggs to survive. Some will feed on the same host animal or person during all life stages but most ticks will have a different host at each stage.

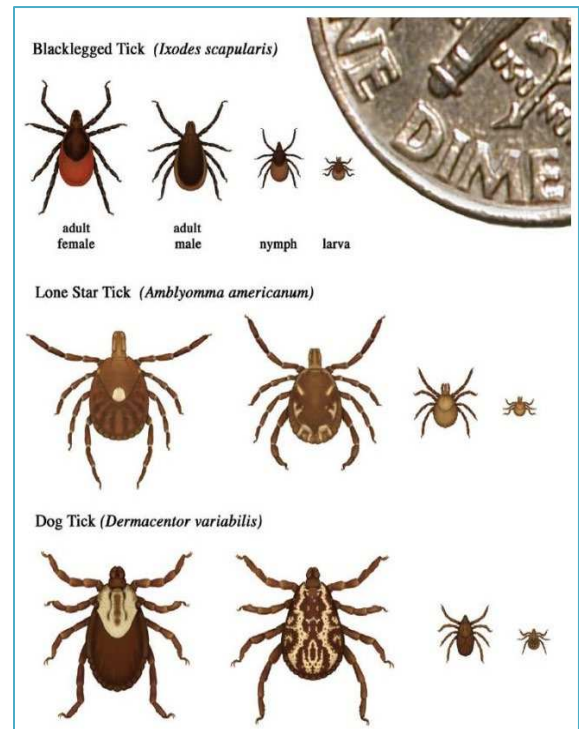
Ticks cannot jump or fly; instead, they climb to tall grasses, brushes, or shrubs and wait for a potential host to brush against them. The tick will then climb onto the host and feed on the host's blood by inserting their mouths into the skin and slowly taking in blood. After feeding, the tick will drop off and prepare for the next life stage. If a tick feeds on a host infected with an infectious pathogen, it will ingest the host's blood *and* the pathogen. The infected tick is then capable of transmitting disease to a new host (including people) at its next blood meal through a bite. Ticks generally need to be attached to the skin of the host for at least 48-72 hours to transmit infection but some diseases can be transmitted after 12-24 hours of attachment.

In Westchester County, the three most common ticks that cause disease among people are the blacklegged tick (*Ixodes scapularis*), lone star tick (*Amblyomma americanum*), and American dog tick (*Dermacentor variabilis*). Both the blacklegged and lone star ticks are widely distributed in the eastern United States while the American dog tick is widely distributed east of the Rocky Mountains.

The blacklegged tick, also known as the deer tick, causes the majority of tick-borne diseases in Westchester. These ticks spread Lyme disease, anaplasmosis, babesiosis, and Powassan virus disease to humans and pose the greatest risk of biting people in the spring, summer, and fall. While all life stages of the blacklegged tick bite humans, the nymphs and adult females are most commonly found on people.

The lone star tick is an aggressive tick that can spread human ehrlichiosis and tularemia. Humans are most frequently bitten by the nymph and adult females, the latter of which is distinguished by a white dot on its back. The greatest risk of being bitten by this tick exists from early spring through late fall.

The American dog tick can spread tularemia (like the lone star tick) and Rocky Mountain Spotted Fever to humans who are most likely to be bitten by adult females during the spring and summer.

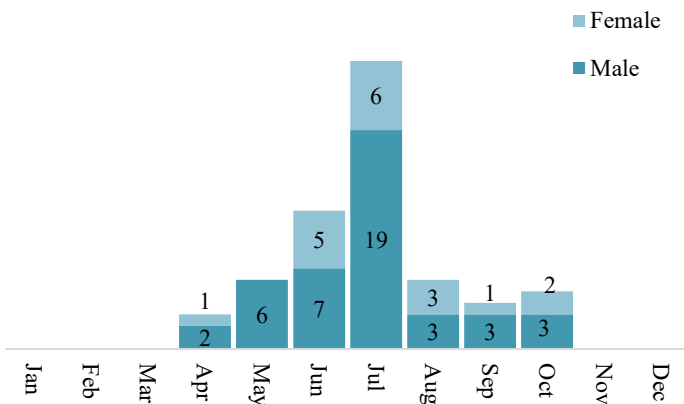


Source: [Centers for Disease Control and Prevention Tick-borne Diseases Tick ID](#)

Anaplasmosis

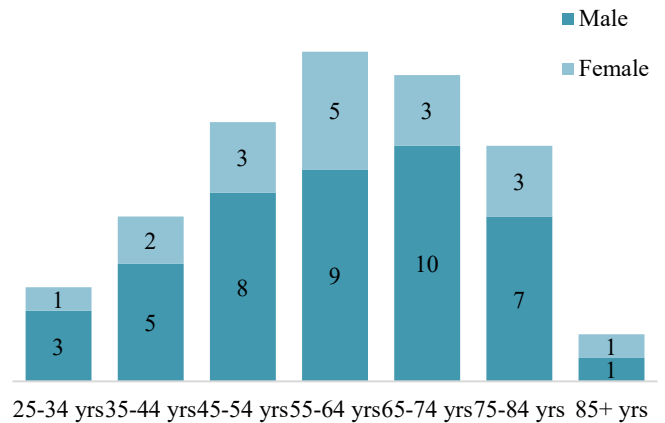
Anaplasmosis, or human granulocytic anaplasmosis (HGA), is primarily spread to humans by a blacklegged deer tick infected with the bacterium *Anaplasma phagocytophilum*. Symptoms will typically begin within 1-2 weeks of the tick bite. The number and combination of symptoms will vary from person to person, and very few people will develop all of the symptoms. Less than 1% of anaplasmosis cases die as a result of their infection. Individuals with weakened immune systems (due to HIV infection, prior organ transplant, removed spleen, or immuno-suppressive therapies such as cancer chemotherapy) may experience more severe outcomes including a higher chance of death. The prescription of antibiotic doxycycline is the first line of treatment for adults and children with suspected anaplasmosis and prevents the development of severe disease complications. Successful treatment of anaplasmosis does not grant immunity to the individual since it is a bacterial infection.

Reported Cases of Anaplasmosis by Month of Disease Incidence, Westchester County, 2023.



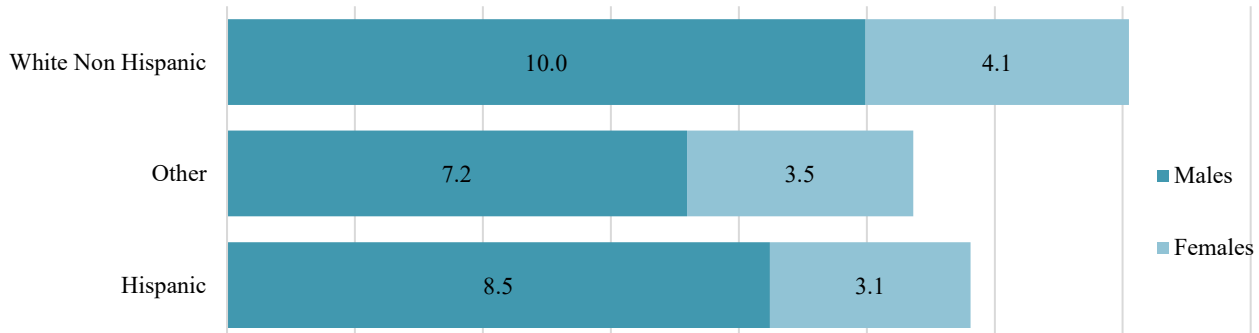
Source: New York State Department of Health. 2024.

Reported Cases of Anaplasmosis by Age and Sex, Westchester County, 2023.



Source: New York State Department of Health. 2024.

Reported Incidences (per 100,000 pop.) of Anaplasmosis by Sex and Race/Ethnicity, Westchester County, 2023.

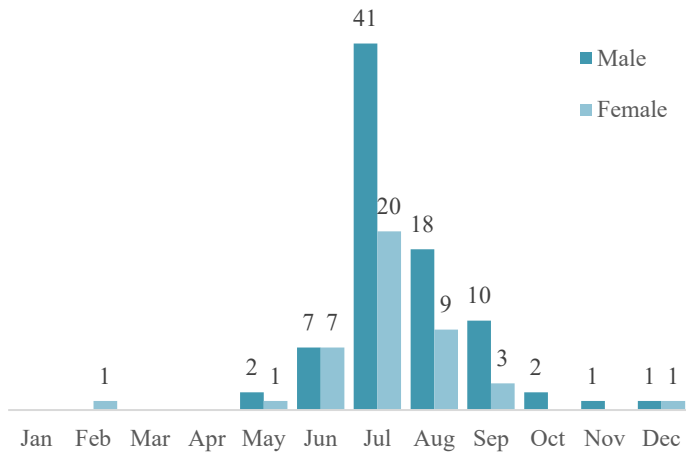


Source: New York State Department of Health. 2024.

BABESIOSIS

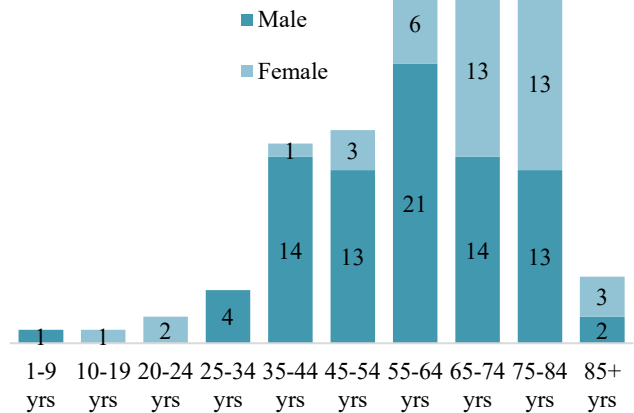
Babesiosis is a rare, sometimes severe, disease primarily caused by the bite of a blacklegged tick infected with the parasite *Babesia microti*. The parasite is typically spread by the young nymph stage of the tick. Babesiosis can also be transmitted (less commonly) from a contaminated blood transfusion or (rarely) from an infected mother to child during pregnancy or delivery. Most people infected with *Babesia microti* will not have any symptoms but some may develop flu-like symptoms one to nine weeks (and sometimes longer) after exposure. *Babesia* parasites can infect and destroy red blood cells, therefore cause hemolytic anemia which may lead to jaundice (yellowing of the skin) and dark urine. Babesiosis can be life-threatening to individuals who have had their spleen removed, have a weak immune system (due to, for example, cancer, HIV/AIDS, or an organ transplant), have serious health conditions (such as liver or kidney disease), or are elderly. Individuals who are infected with *Babesia microti* but do not have symptoms do not need to be treated. For those that do experience symptoms, treatments are available and recommended by a health care provider upon diagnosis.

Reported Cases of Babesiosis by Month of Disease Incidence, Westchester County, 2023.



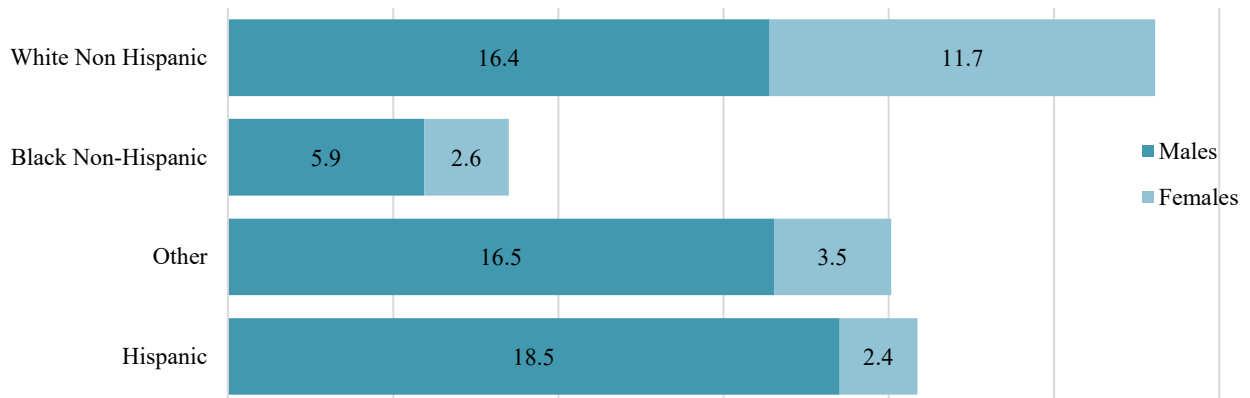
Source: New York State Department of Health. 2024.

Reported Cases of Babesiosis by Age and Sex, Westchester County, 2023.



Source: New York State Department of Health. 2024.

Reported Incidences (per 100,000 pop.) of Babesiosis by Sex and Race/Ethnicity, Westchester County, 2023.



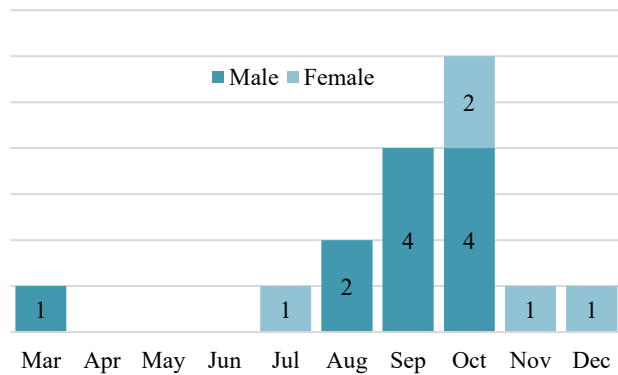
Source: New York State Department of Health. 2024.

Dengue Fever

Dengue fever is a mosquito-borne illness that occurs in tropical and subtropical areas of the world. It is typically spread by the *Aedes* mosquito. Dengue outbreaks are reported frequently in the Caribbean, Central and South America, South East Asia and the Pacific Islands. The mild form causes high fever and flu-like symptoms. The more severe form (dengue hemorrhagic fever), can cause serious bleeding, sudden drop in blood pressure and death. Symptoms of dengue usually begin within 2 weeks after being bitten by an infected mosquito. They also typically last 2-7 days. Most people normally recover after about a week.

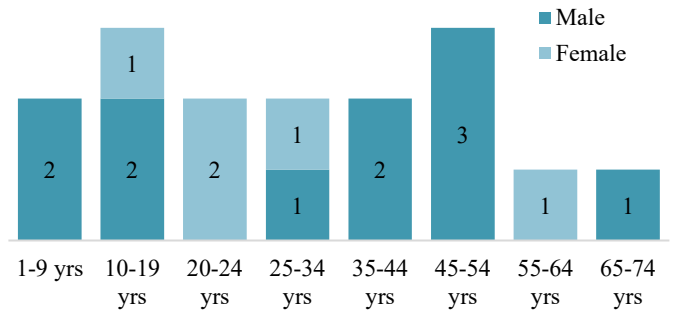
There is no specific medicine to treat dengue – although there is a vaccine recommended for use in children 9-16 years, with lab confirmation of a previous infection. It is however normally recommended that the patient rest as much as possible, take acetaminophen to control fever and relieve pain and drink as much fluid as possible, stay hydrated and see a healthcare provider if a fever develops.

Reported Cases of Dengue Fever, by Month of Disease Incidence, Westchester County, 2023.



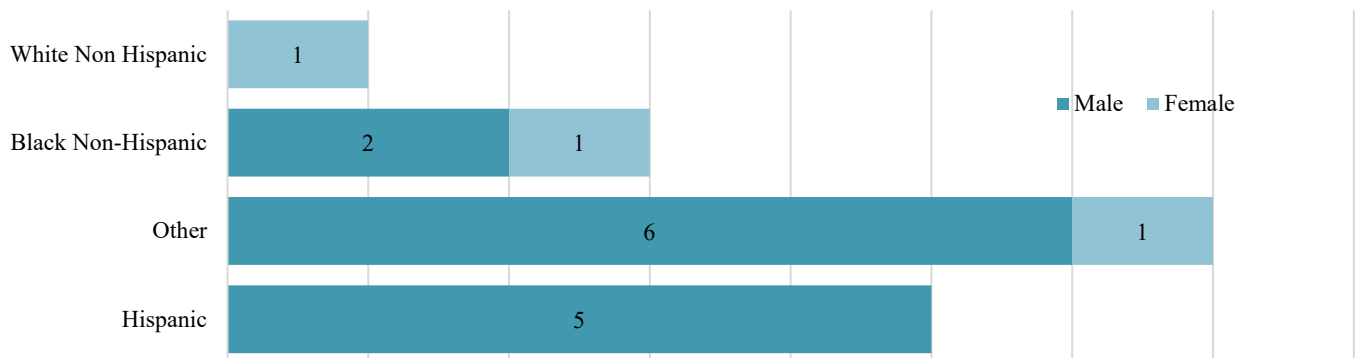
Source: New York State Department of Health. 2024.

Reported Cases of Dengue Fever, by Age and Sex, Westchester County, 2023.



Source: New York State Department of Health. 2024.

Reported Cases of Dengue Fever by Sex and Race/Ethnicity, Westchester County, 2023.

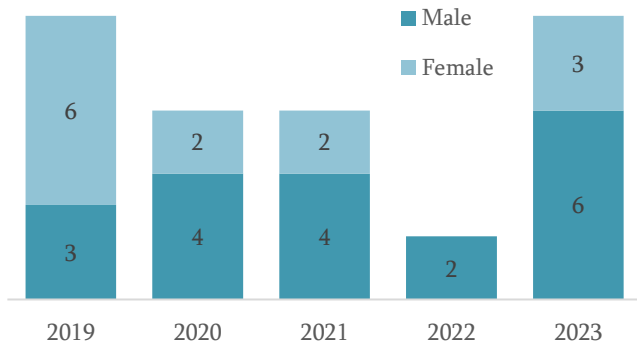


Source: New York State Department of Health. 2024.

EHRlichiosis

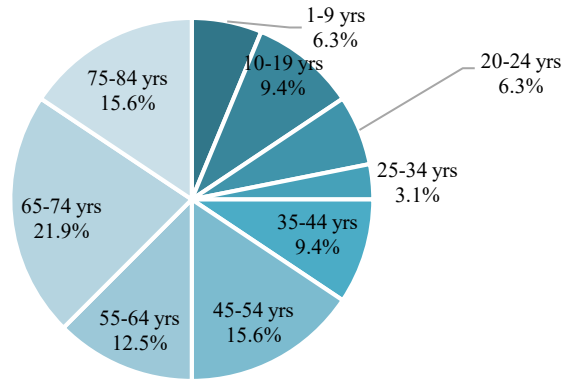
Individuals bitten by a lone star tick infected with *Ehrlichia chaffeensis* or *Ehrlichia ewingii* may develop ehrlichiosis, a disease closely related to anaplasmosis. Symptoms of ehrlichiosis usually develop 1-2 weeks after the tick bite and the number and combination of symptoms vary from person to person with very few people developing all of the symptoms. A skin rash is not commonly reported in persons infected with *Ehrlichia ewingii* but could occur in up to 60% of children and less than 30% of adults infected with *Ehrlichia chaffeensis*. An estimated 1.8% of ehrlichiosis cases die as a result of their infection. Similar to anaplasmosis cases, individuals with weakened immune systems (due to HIV infection, prior organ transplant, removed spleen, or immunosuppressive therapies such as cancer chemotherapy) may experience more severe outcomes of ehrlichiosis including a higher chance of death. Doxycycline is the first line of antibiotic treatment for adults and children with suspected ehrlichiosis and prevents the development of severe disease complications. Delaying treatment may result in severe illness or death. Like anaplasmosis, successful treatment of ehrlichiosis does not grant immunity to the disease because it is a bacterial infection.

Reported Cases of Ehrlichiosis Westchester County, 2019-2023.



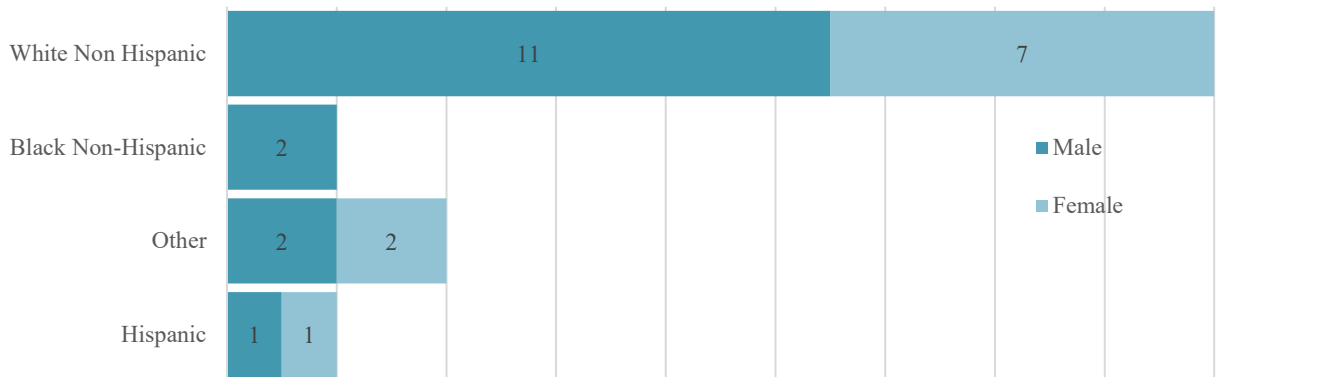
Source: New York State Department of Health. 2024.

Reported Cases of Ehrlichiosis by Age. Westchester County, 2019-2023



Source: New York State Department of Health. 2024.

Reported Cases of Ehrlichiosis by Sex and Race/Ethnicity, Westchester County, 2019-2023.



Source: New York State Department of Health. 2024.

Lyme Disease

The Lyme disease bacterium *Borrelia burgdorferi* can be spread to humans through the bite of an infected blacklegged tick, the same tick that can spread anaplasmosis and babesiosis. The infected tick must be attached to a person for at least 36-48 hours before the bacterium can be transmitted. Lyme disease cannot be spread from person to person, and transmission from an infected pregnant woman to her fetus is extremely rare.

Persons with Lyme disease will start to see symptoms within 3-30 days after the tick bite. Approximately 70-80% of infected persons will develop a circular bull's eye rash about two inches in diameter (called erythema migrans) around or near the location of the bite. This rash is rarely itchy or painful but may gradually expand up to 12 inches or more over a period of days.



"Classic" erythema migrans rash

Source: [Centers for Disease Control and Prevention Signs and Symptoms of Untreated Lyme Disease](#)

Symptoms of Lyme Disease

Early symptoms (3-30 days after tick bite):

- Fever and chills
- Headache
- Fatigue
- Muscle and/or joint aches
- Swollen lymph nodes
- Erythema migrans (EM) rash

Symptoms of disease progression (days to months after tick bite):

- Additional EM rashes on other body areas
- Severe headaches and neck stiffness
- Dizziness or shortness of breath
- Arthritis with severe joint pain and swelling
- Intermittent pain in tendons, muscles, joints, and bones
- Shooting pains, numbness, or tingling in the hands or feet
- Facial palsy (loss of muscle tone or droop on one or both sides of the face)
- Inflammation of the brain and spinal cord
- Lyme carditis (irregular heart beat)
- Nerve pain
- Problems with short-term memory

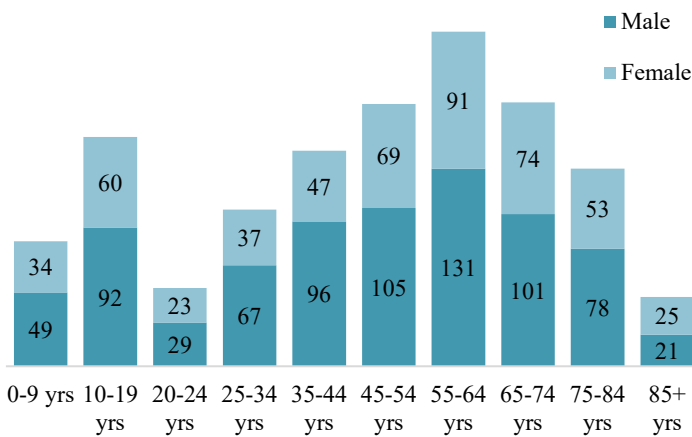
If Lyme disease is not recognized or treated in the early stage, more severe symptoms may occur. The most severe symptoms may appear until weeks, months, or years after the tick bite.

Lyme disease cases are treated with antibiotics such as doxycycline, amoxicillin, and cefuroxime axetil. Individuals with certain neurologic or cardiac forms of illness may require additional treatment but cases treated in the early stages of disease will usually recover completely and quickly. There is no approved vaccine for Lyme disease.

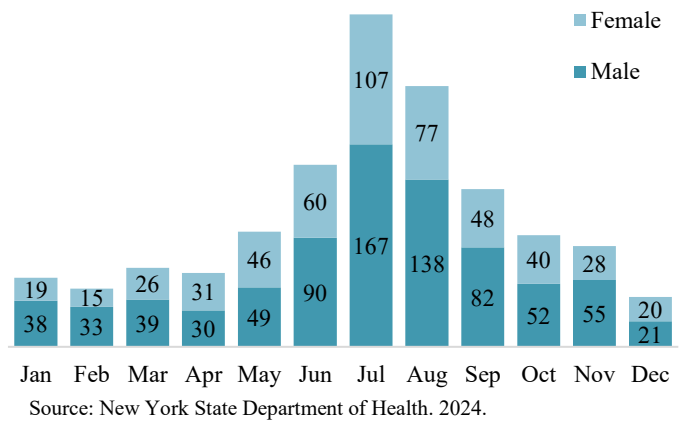
Lyme Disease

The Westchester County Department of Health annually investigated all potential Lyme disease cases until 2007 when it started conducting Lyme disease sentinel surveillance using a sampling methodology developed by the New York State Department of Health. Starting from 2022, the sentinel surveillance was discontinued and Lyme disease surveillance were based on laboratory reports for case classification. All cases that meet the updated laboratory criteria are classified as probable cases.

Reported Cases of Lyme Disease by Age and Sex, Westchester County, 2023.

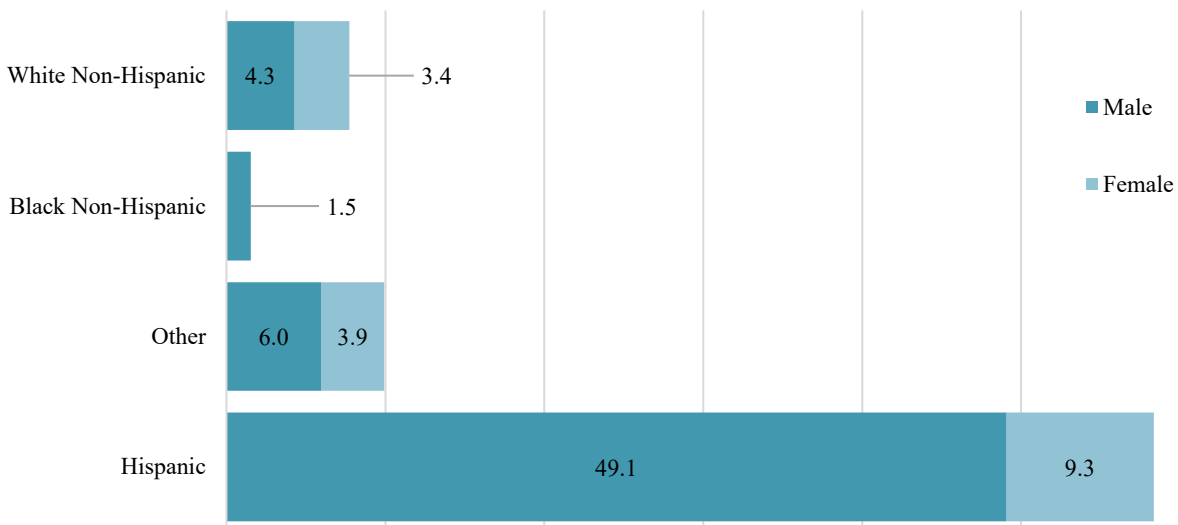


Reported Cases of Lyme Disease by Month of Disease Incidence, Westchester County, 2023.



Source: New York State Department of Health. 2024.

Reported Incidences (per 100,000 pop.) of Lyme Disease by Sex and Race/Ethnicity, Westchester County, 2023.

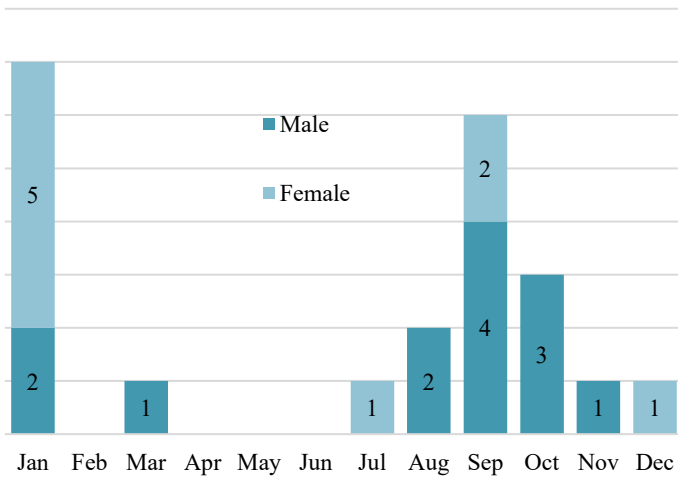


Source: New York State Department of Health. 2024.

Malaria

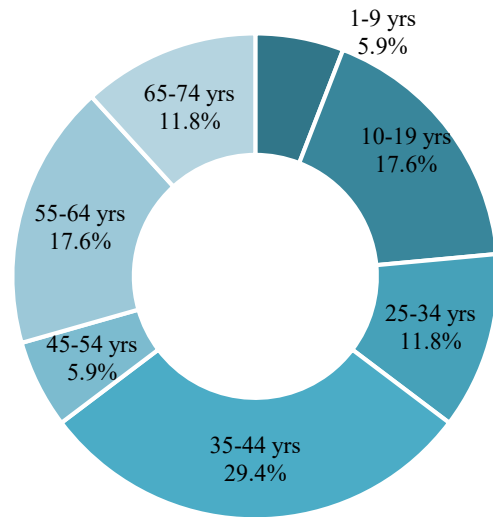
Malaria is a disease caused by a parasite. Mosquitoes spread the parasite to people when they bite them. Malaria symptoms usually appear within 7-30 days but can take up to one year to develop. Symptoms may include high fevers, shaking chills, and flu-like illness. Without treatment, malaria can cause severe illness and death. The mosquitoes that spread malaria are found in Africa, Central and South America, parts of the Caribbean, Asia, Eastern Europe, and the South Pacific. Travelers going to these countries may get bit by mosquitoes and get infected. About 2,000 cases of malaria are diagnosed in the United States annually, mostly among returned travelers.

Reported Cases of Malaria by Month, Westchester County, 2023.



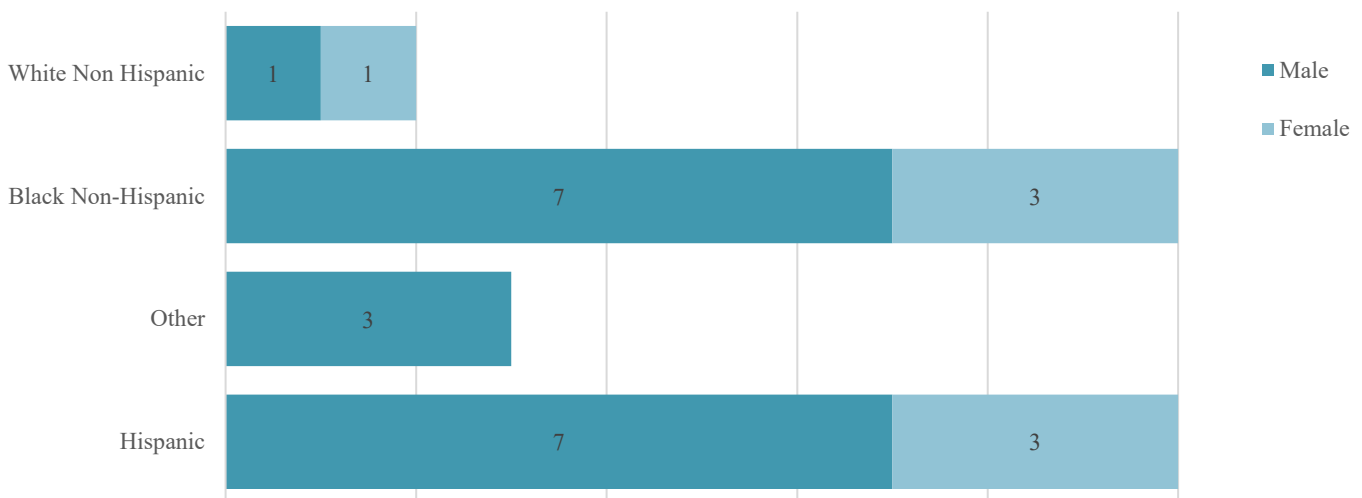
Source: New York State Department of Health. 2024.

Reported Cases of Malaria by Age and Sex, Westchester County, 2023.



Source: New York State Department of Health. 2024.

Reported Cases of Malaria by Sex and Race/Ethnicity, Westchester County, 2023.



Source: New York State Department of Health. 2024.

Other Vector Borne Diseases

Other vector borne diseases less commonly reported in Westchester County include Rocky Mountain Spotted Fever and Chikungunya.

American dog ticks infected with the bacterium *Rickettsia rickettsii* can transmit Rocky Mountain Spotted Fever (RMSF), a serious illness that can lead to death if it is not treated early. Symptoms of RMSF will usually appear 2 to 14 days after the bite and can rapidly progress to a serious, life-threatening illness. Most RMSF cases will develop a rash 2 to 5 days after a fever. The rash will start on the wrists, forearms, and ankles and spread to the trunk or the rest of the body.

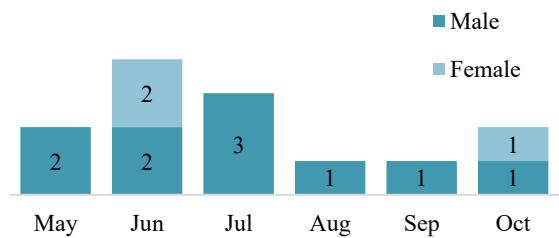
Some survivors of severe RMSF may have permanent damage such as amputation of arms, legs, fingers, or toes due to damage to blood vessels; hearing loss; paralysis; and mental disability.

RMSF is treated with the same antibiotic used for anaplasmosis and ehrlichiosis (doxycycline) and is most effective when started within five days of when symptoms first develop. Between 2019 and 2023, 13 cases were reported in Westchester. with one death in 2015. Ten cases were male, and 3 females.

Symptoms of Rocky Mountain Spotted Fever

- Fever
- Headache
- Rash
- Muscle pain
- Malaise (general discomfort)
- Gastrointestinal symptoms (abdominal pain, nausea, vomiting)

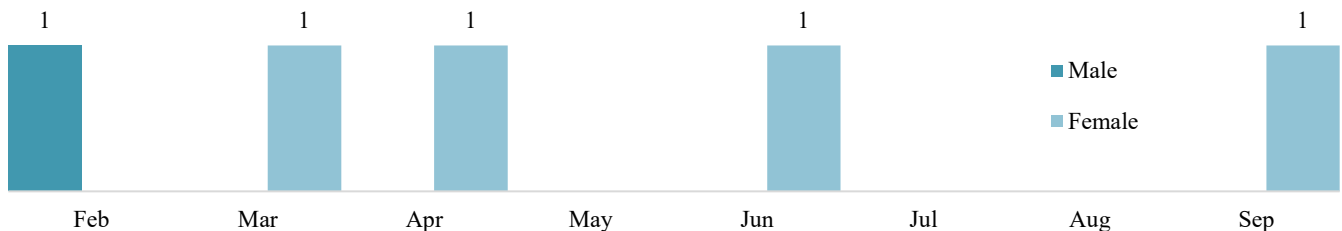
Reported Cases of RMSF by Month, Westchester County, 2019-2023.



Source: New York State Department of Health. 2024.

Chikungunya virus disease (chikungunya) is caused by a virus primarily spread to people through the bite of infected mosquitoes. If infected, people can spread the virus to mosquitoes and rarely to other people. The risk of a person spreading the virus is highest during the first week of illness. Chikungunya virus can be found in many parts of the world, including Africa, the Americas, Asia, Europe, and islands in the Indian and Pacific Oceans. The virus belongs to a group of viruses called alphaviruses. Other alphaviruses causing a similar disease include Mayaro virus and Ross River virus. Because of the high level of virus in blood, spread can occur through, blood transfusion, handling infected blood in a laboratory, or drawing blood from an infected patient. The virus is **not** spread from person-to-person and is **not** spread through coughing, sneezing, or touching.

Reported Cases of Chikungunya by Month of Disease Incidence, Westchester County, 2019-2023.



Source: New York State Department of Health. 2024.

Tips

How to Minimize Your Risk for Tick-borne Diseases

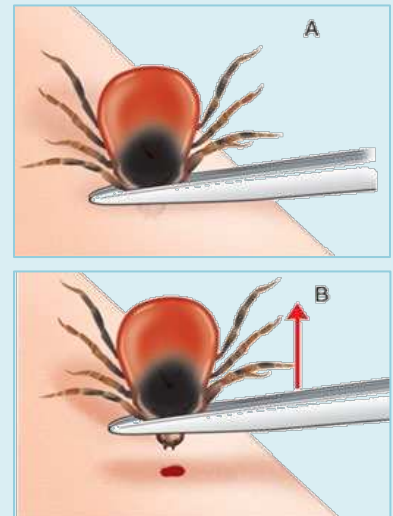
The best way to avoid infection with tick-borne diseases is to prevent tick bites:

- ✓ **Protect yourself and your family**
 - Avoid wooded or grassy areas especially during the spring and summer months
 - Wear light-colored clothes to spot ticks more easily
 - Tuck your pants into your socks and your shirt into your pants to create a barrier between ticks and your skin
 - Use an Environmental Protection Agency (EPA)-registered insect repellents containing DEET and permethrin products when outdoors
 - Do tick checks after outdoor activities such as gardening, hiking, or picnicking
 - Inspect the entire body (parents should check their children) and remove ticks promptly
- ✓ **Protect your property**
 - Keep grass cut short
 - Remove leaf litter and debris
 - Create a barrier of wood chips between your lawn and busy vegetation or wooded areas
 - Select plantings that do not attract deer

Tick Removal Tips

For additional prevention information and tips, call the Westchester County Department of Health at (914) 813-5000 or visit <http://health.westchestergov.com/tick-borne-diseases>.

- ✓ **To properly remove a tick:**
 - Use a pair of clean, fine-point tweezers to grasp the tick as close to the skin as possible at the site of attachment (by the head or mouthparts – see image A to the right)
 - Firmly and steadily pull the tick away from the skin (see image B)
 - Clean the bite area and your hands with soap and water, rubbing alcohol, or hydrogen peroxide
 - Monitor the site and report early signs of disease to your health care provider
- ✓ **DO NOT:**
 - Grasp the tick by the body
 - Twist the tick to remove it from your skin
 - Put petroleum jelly, a hot match, or any other irritant on the tick before removing it



Source: Reichman EF: *Emergency Medicine Procedures, Second Edition*: www.accessemergencymedicine.com
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